Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	
Creation of a Low Power Radio Service	)	MM Docket No. 99-25
	)	

To: The Commission

COMMENTS OF THE PUBLIC RADIO REGIONAL ORGANIZATIONS

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SUMMARY

The PRROs, public radio regional organizations joined by Minnesota Public Radio, urge the Commission not to move forward with LPFM at this time. LPFM will adversely affect public radio, in that it will result in (i) loss of existing public radio FM translator and satellite/repeater service; (ii) loss of existing public radio service outside protected contours; (iii) jeopardization of the substantial federal, state and private investment in public radio; (iv) loss of subcarrier services, particularly radio reading services for the print disabled; (v) an unknown (and unknowable) impact on public radio conversion to digital audio broadcasting; and (vi) the introduction of an intolerable level of new interference throughout the FM band, with public radio bearing the brunt of the effects of new interference because of its typical program modulation. In addition, the PRROs are concerned that LPFM is not a viable service, and that the Commission cannot constitutionally force LPFM licensees to fulfill the Commission's expectations.

If, despite the record to the contrary established in this proceeding, the Commission should feel that LPFM is a sufficiently important service, the FCC should find other, less-occupied spectrum, for LPFM to use or advocate another distribution mechanism, such as Internet webcasting. If the Commission should conclude that LPFM must use the FM band (despite the PRROs and others' opposition to the overlaying of this new service on existing public radio service), the PRROs urge the Commission to delay LPFM until radio stations (and public radio stations in particular) have been able to fully study the effects of LPFM on the existing RF environment and to implement the conversion to digital audio broadcasting so that the full impact of LPFM on real world DAB can be evaluated.

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Rocky Mountain Public Radio and West Coast Public Radio, by their attorneys, and Minnesota Public Radio ("MPR"), by its attorneys, joined by Eastern Public Radio, California Public Radio, Public Radio in Mid-America ("PRIMA"), and Southern Public Radio (collectively, the public radio regional organizations and, together with MPR, the "PRROs"), file these comments in response to the FCC's *Notice of Proposed Rulemaking on the Creation of a Low Power Radio Service* (the "LPFM" proceeding).

While the public policy concept of a "community radio service" is laudable, the unintended consequences of the proposed LPFM service inflicted on current FM spectrum users, particularly public radio stations, will be devastating. Simply put, based on the available evidence at this time, the PRROs believe that any low power radio service cannot be "overlaid," in whole or in part, on existing FM spectrum, without derogating public radio and the FCC's mandate to serve the public interest, convenience, and necessity. If the policy goal is worth pursuing now, the FCC must find other spectrum, not heavily encumbered by incumbents on the verge of conversion to digital radio, to use – the "community radio" envisioned by the FCC cannot thrive on the table scraps of the fully mature FM spectrum, particularly when those table scraps may degrade or destroy listener reception of public radio service. Alternatively, the

Commission should wait until after the full implementation of digital radio to authorize a LPFM service so that any adverse impact on existing FM spectrum users or on new LPFM entrants can be known and avoided.

I. INTRODUCTION

Rocky Mountain Public Radio, West Coast Public Radio, Eastern Public Radio, California Public Radio, PRIMA and Southern Public Radio are regional membership organizations for public radio stations across the contiguous United States. These organizations represent over 169 noncommercial educational radio station licensees with over 370 combined station transmitters (primary and FM translators). MPR is a regional network whose core values include a commitment to strengthen public radio nationally. MPR is the licensee of 29 noncommercial educational FM radio stations and 18 translators.

Together, the PRROs represent public radio stations in virtually every state in the United States. PRRO member stations include stations that serve entire states or regions, major markets, medium markets, smaller markets and isolated rural areas with national and local programming, including substantial news and public affairs programming, classical music programming, jazz, world music, alternative music, minority-oriented programming (including African/American, Hispanic and Native American programming) and other niche music and cultural programming genres.[1] PRRO members include FCC licensees that are state and governmental entities, college and universities, school districts and nonprofit educational organizations (or "community" licensees whose governing boards are drawn from the community of license); PRRO members engage in active community outreach. The unifying factor among these diverse licensees and

[1] The PRROs refer the Commission to the Comments of the Corporation for Public Broadcasting ("CPB") in this proceeding, which discuss public radio's service for minority and niche audiences.

stations is a common mission to provide the highest quality public radio service to their communities of license and the citizens of the United States. PRRO stations do not answer to a corporate bottom line or to corporate shareholders; their very *raison d'être* is public service.[2]

The PRROs are sympathetic to the policy objectives behind the NPRM. Indeed, the Commission's stated goals "to address unmet needs for community-oriented radio broadcasting" and to "promote additional diversity in radio voices and program services" are near and dear to the hearts of PRRO member stations -- these are the goals of public radio. But the harsh reality is that the FM spectrum is a scarce resource – many PRRO member stations would like to be able to offer additional public radio program services, address more unmet community needs in programming, and start additional public radio stations, but cannot do so due to existing spectrum limitations. Indeed, as existing licensees, PRRO member stations would not qualify for

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[2]The Commission itself has stated:

> Public broadcasting is explicitly encouraged by various Commission rules and policies. Perhaps most notable among these is our spectrum reservation policy whereby noncommercial stations are afforded protected frequency allocations for their exclusive use. Other state and federal governmental entities also accord public stations favored status by various means, including preferential tax treatment and considerable direct financial subsidies...[T]he very definition of the service, the status of its operating stations, and its essentially non-profit, noncommercial programming nature make public broadcasting stations very different, in programming terms, from their commercial counterparts. With this in mind, we expect that as a practical matter the programming of these stations will reflect their special status and that they will provide their communities with significant alternative programming designed to satisfy the interests of the public not served by commercial broadcast stations. We would assume, for example, that in the rare case where the commercial media market appeared to ignore a significant issue in a community, the public stations would be among the first to address it, providing an important alternative and competitive spur to the other local media. Such responsive programming would be entirely consistent with the nature and historical performance of these stations.

See, e.g., Revision of Program Policies and Reporting Requirements Related to Public Broadcasting Licenses, 98 FCC 2d 746, 751 (1984).

spectrum available to LPFM applicants under the regimen proposed in the *NPRM.* To that extent, the Commission's proposal does not serve its stated goals.

As membership organizations, the PRROs are vitally interested in ensuring that the radio spectrum used by their public radio member stations is properly regulated, so that PRRO member stations can continue to serve existing listeners and will have opportunities to grow and expand public radio service throughout the United States. After careful consideration and thoughtful discussion, the PRROs have regretfully concluded that implementing the FCC's LPFM proposal at this time would wreak irreparable harm on the public interest and risk the future of public radio in this country.

Congress has found and declared that:

(2) it is in the public interest to encourage the growth and development of public radio and television broadcasting, including the use of such media for instructional, educational and cultural purposes;

(4) the encouragement and support of public telecommunications, while matters of importance for private and local development, are also of appropriate and important concern to the Federal Government;

(5) it furthers the general welfare to encourage public telecommunications services which will be responsive to the interests of people both in particular localities and throughout the United States, which will constitute an expression of diversity and excellence, and which will constitute a source of alternative telecommunications services for all of the citizens of the Nation;

(7) it is necessary and appropriate for the Federal Government to complement, assist, and support a national policy that will most effectively make public telecommunications services available to all citizens of the United States;

(8) public television and radio stations and public telecommunications services constitute valuable local community resources for utilizing electronic media to address national concerns and solve local problems through community programs and outreach programs;

(9) it is in the public interest for the Federal Government to ensure that all citizens of the United States have access to public telecommunications services through all appropriate available telecommunications distribution technologies;

47 U.S.C. Sec. 396 (a) (2), (4), (5), (7), (8) & (9) (1999).

The PRROs urge the Commission to refrain from taking any action in this LPFM proceeding that could harm the existence, growth and development of public radio now and in the future. The PRROs believe that the Commission should not authorize LPFM in FM spectrum, and that the best course of action is for the FCC to find alternative ways, such as other spectrum or webcast opportunities, to provide LPFM service. At the very least, it should delay LPFM implementation until after the full effect of its impact on digital audio broadcasting (including in-band on-channel technology) has been implemented.

II. IMPACT ON EXISTING PUBLIC RADIO LISTENERS AND SIGNALS

The PRROs submit that the FM spectrum is fully (or, at the very least, near fully) mature. The addition of new low power radio stations is a "zero sum" game which would result in disruption of established public radio listening patterns, the loss of service to public radio listeners and the inability for public radio to serve new listeners. For public radio stations, this result also jeopardizes the substantial federal, state and private investment in existing public radio stations.

A. Impact on FM Translators. First, LPFM will jeopardize public radio service on FM translator stations throughout the country, particularly those in the most sparsely populated regions. Over nine (9) million persons in the United States receive a public radio signal through a public radio translator station.[3] Public radio (and the federal government through appropriations to the Corporation for Public Broadcasting ("CPB") and the Public Telecommunications Facilities Program of NTIA, U.S. Department of Commerce) have invested heavily in FM translator stations to extend service to unserved or underserved areas or provide

[3] Corporation for Public Broadcasting, Network Report, Census of Population and Housing (1990).

service to rural areas that are sparsely populated. In contrast, commercial FM radio stations can only use translators to "fill-in" existing service within a protected area. Thus, the vast majority of FM translator stations authorized by the FCC are licensed to noncommercial educational broadcasters. See Attachment A for maps providing examples of public radio station translator service throughout entire regions.

The PRRO member stations report that public radio FM translator stations are typically operated "at the margin" or "at a loss," in that the costs of operating the public radio translators generally exceed the donations received from listeners served by those translators. The PRRO stations persist in the operation of translators because they provide valuable service to communities -- many times, the only public radio service to listeners in isolated areas. Thus, any action by the FCC that would make translators more difficult or costly to operate, or impair translator reception in any way, will have a corresponding negative impact on public radio translator service nationwide.

Both the input and output signals of FM translator stations would be subject to interference from LPFM stations, including first, second or third adjacent channel interference. Moreover, public radio stations often operate "satellite/repeater" stations that rely on the input signal of a main station (much like a translator does). In fact, in PRROs estimation, interference to translators and satellite/repeater stations is very likely because new LPFM stations are likely to be established in areas closest to population centers where frequencies are "available," such as suburban areas and communities immediately adjacent to metropolitan areas that fall just outside the mileage separations contemplated in the *NPRM*. These are the very areas where public radio translators (and satellite/repeater inputs) would require protection from LPFM. In fact, interference with these suburban translators or satellite/repeaters could knock out entire chains of

public radio service in states or regions.[4] The "input" signals for FM translators and FM satellite/repeater stations must traverse these areas in order to reach the translators and satellite/repeaters; moreover, these are also the areas where FM translators and satellite/repeaters are likely to be located in order to "extend" public radio service. Even a very low powered "microradio" station could disrupt translator or satellite/repeater service. Because LPFM has been proposed to be higher priority than translators are, "secondary" FM translator services could be lost.[5]

Even if the FCC would require new LPFM stations to protect existing translators, the expansion of public radio translators to new service areas would be restricted because "later comer" public radio translators would be forced to protect earlier LPFM stations. Moreover, there has recently been an onslaught of FM translator applications by national "noncommercial" filers who are not affiliated with public radio stations.[6] Thus, public radio stations are already facing increasing difficulties finding available frequencies for the future expansion of FM translator service. Authorizing LPFM would only further complicate and retard the development of public radio station translators, which are an essential ingredient in providing public radio

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[4] For example, see the map of KUER-FM's Utah translator service in Attachment A. Interference that knocked out reception of the input signal to the Delta, Utah translator would knock out seven other translators later in the chain.

[5] In fact, public radio translator services already must battle to preserve services. For example, Boise State University's radio translator service to the Sun Valley, Idaho area was disrupted when a new full service station on a first adjacent channel knocked out the Sun Valley translator's input channel. While the PRROs understand and accept that existing translators are secondary to full-service stations (for good spectrum-efficiency reasons), the PRROs do not believe that existing translators should be subject to additional encroachment from LPFM. The FCC should not change the "rules of the game" for translators and deprive listeners of current public radio translator service.

[6] See Comments and Reply Comments of Rocky Mountain Public Radio and West Coast Public Radio, as well as the Comments and Reply Comments of the Station Resource Group, in MM Docket No. 95-31.

service to all citizens of the United States, as Section 396(a)(7) of the Communications Act mandates.

B. Impact on Existing Service Outside Primary Contours. Second, LPFM will result in loss of service to listeners who reside (or commute) outside PRRO stations' protected primary contours, but who can nevertheless presently receive a public radio signal. Currently, public radio stations are protected from encroaching interference by co-, first, second and third adjacent channel stations based on contour protection, which uses mathematical calculations to predict how far a radio signal can reasonably be expected to travel and entitled to protection. The LPFM proposal would protect stations based on a slightly different method -- minimum channel spacing -- based again on predictions of how far a radio signal will travel. However, the development of public radio nationwide has depended on the phenomena of service to listeners beyond the protected contour.

Thus, PRRO member stations report that there are substantial numbers of station listeners and donors that reside outside stations' protected contours, sometimes up to many miles outside a protected contour. These persons currently receive a radio signal of sufficient quality to "tune in" and support public radio, even if the FCC methods predict that no listenable signal should be present. For example, a Louisville, Kentucky public radio station, WUOL(FM), reports listeners in Cincinnati, Ohio -- over 102 miles away from Louisville. A Denver, Colorado public radio station, KCFR-FM, reports significant listenership in Fort Collins, Colorado – over 62 miles away from Denver – and in Cheyenne, Wyoming – over 100 miles away from Denver. Public radio Stations KXPR/KXJZ in Sacramento, California, report that fifty-four percent (54%) of the station's subscribers reside outside the stations' protected contours. Similarly, Station WVRO, Oswego/Syracuse, New York reports that two-thirds (66.6%) of its listenership resides outside

the stations' protected contour and Station WBJB-FM reports that over thirty-two percent (32%) of its listener/donors reside outside the station's protected contour. An Ames, Iowa, public radio station, WOI-FM, reports that 22% of its listeners are outside its protected contour -- an astounding figure given that the area outside the WOI-FM protected contour is sparsely populated Iowa farmland. A San Francisco public radio station, KQED-FM, reports substantial listenership outside its protected contour – even in the heavily congested RF environment of San Francisco.

While LPFM proponents might call these anomalies, they are scenarios that public radio stations regularly experience -- their listeners desire for public radio programming is so strong, that listeners will tune in a signal from many miles away just to have some reception of that programming. See Attachment B for additional case studies of selected public radio stations that report substantial numbers of listeners/donors outside their predicted service area. Thus, the PRROs submit that the authorization of LPFM will jeopardize public radio service to existing listeners who reside in these "unprotected" areas and who are already "tuning in" from far away to receive the public radio programming that they crave.

In fact, the very LPFM allocation scheme contemplated by the FCC, coupled with the elimination of second and third adjacent channel protection, would capitalize on use of these theoretically "unserved" areas for LPFM, even when those areas are actually receiving service to listeners. While theoretically, an LPFM station could be established without causing interference, in actuality, there will be a loss of public radio signal reception.

The PRROs emphatically believe that <u>any</u> loss or disruption of existing public radio service is too high a price to pay for the limited benefits afforded by LPFM in the FM band.

C. Impact on the Present Investment in and Infrastructure of Public Radio.

Third, adoption of the LPFM proposal will also jeopardize the substantial federal, state and private investment in public radio stations. Existing public radio transmission plants were conceived, engineered and funded based on the FCC's existing reserved and nonreserved FM band allocation system and in contemplation of the spectrum protection afforded by the current rules. As described above, the existing public radio infrastructure depends heavily on service that exists outside predicted contours and on FM translators to extend service. In fact, most public radio regional and statewide networks transmission sites were selected to maximize service that might be obtained beyond the protected contour and to minimize the number of transmitters necessary – it would not have been cost-efficient or feasible to design statewide or regional coverage so that protected contours overlapped sufficiently to create seamless "protected" service. *The "theoretical gaps" that exist between these stations do not exist in reality.* This means there is simply not enough room for LPFM in the reserved band.

Through the auspices of CPB and federal funding from PTFP, the federal government has acted to fulfill the mandate of Section 396(a) of the Communications Act. Over the course of the past several decades, public radio transmission systems were built with federal and state support, as well as private support from corporations and individual donors. The Commission should not take any action to authorize a new LPFM service that would jeopardize these investments or that would preclude the future expansion and growth of public radio service nationwide.

D. Impact on FM Subcarriers and the Print Disabled. LPFM could also destroy existing FM subcarrier services, including radio reading services for the blind and print handicapped. Public radio stations, like all radio stations, have the capacity for two or more

subsidiary communications authorizations ("SCA") that are frequency-multiplexed on the FM modulating signal. While SCAs can be used to produce revenue, many public radio stations lease one or more subcarriers to radio reading services.[7] The subcarrier signals, however, are extremely fragile and susceptible to interference, including interference from first, second and third adjacent channels. Even now – with second and third adjacent channel protections in place – radio reading services suffer from poor quality transmissions, given the existing RF congestion and the fragility of the FM subcarrier signal.

Radio reading services are conducted by nonprofit organizations that read printed materials over the public radio FM subcarrier channel. Users of these services are blind or otherwise print disabled individuals. Persons desiring these services need a special radio receiver capable of decoding subcarrier transmissions. These receivers are often provided by the reading service free of charge as part of their community service. The typical radio reading service has a small professional staff of 2 to 3 persons, and a volunteer corps of about 100 persons. Programming is predominantly local, with the reading of local newspapers dominating.

Thus, many reading services are inherently local in nature – the services read aloud local daily newspapers, shopping and grocery store flyers, comics, community events news, and obituaries, as well as more national information, such as national newspapers and books on the best-seller list. Much of the local information is not available in other formats for the visually impaired. The focus is on providing access to current, print material to persons with the need for this type of access.

[7] Indeed, the FCC Rules require noncommercial stations to ensure the availability of at least one subcarrier for radio reading services, upon request.

The PRROs are not aware that the proponents of LPFM, or the Commission, have conducted any studies at all on the effect of LPFM on FM subcarriers or on radio reading services. Based on experience, the PRROs believe that FM subcarriers and radio reading services will suffer massive degradation in quality from the authorization of LPFM (especially in fringe areas of the main channel). Radio reading service subcarriers modulate at approximately 9% of the main channel's signal. Thus, the signal of a radio reading service degrades and becomes unlistenable much sooner than a main channel when interference or other signal degradation occurs. While a full-scale study of the effects of LPFM on FM subcarriers is beyond the scope of the PRROs resources, the PRROs urge the Commission to conduct real world tests before sacrificing the needs of the print disabled to LPFM.

When the Commission acted to enable and foster the creation of radio reading services nationwide, it provided a vital communications link for the blind and print disabled. The PRROs urge the Commission to avoid jeopardizing the single, fragile link this disabled group has with their communities. Radio reading services might already be threatened by the adoption of an IBOC standard for the digitization of radio. Should LPFM move forward, the potential problems for radio reading services multiple exponentially. With the Commission having taken steps recently to ensure access to telecommunications services by people with disabilities;[8] it would be a travesty to deprive the blind and print disabled of an existing service, given the illusory benefits of LPFM.

[8] See FCC News Release, *FCC Ruling is "Most Significant Action Since ADA"* dated July 14, 1999. Also available at: (http://www.fcc.gov/Bureaus/Common_Carrier/News_Releases/1999/nrcc9048.html)

E. **Impact On Future Conversion To Digital.** The PRROs are concerned that the impact of LPFM on the future conversion of radio to digital transmissions is unknown and unknowable at this time. Digital radio is still at a nascent stage. One proponent, USA Digital Radio Partners, L.P. ("USADR") has submitted a petition for rulemaking on authorizing In-Band-On-Channel digital service ("IBOC") to the FCC, but the petition has not been put out for notice and comment rulemaking. Admittedly, USADR may have suggested that the effects from second- and third- adjacent interference on a digital IBOC signal will be negligible. Yet, claims by a proponent relating to a not-yet-adopted standard for not-yet-authorized digital audio broadcasting based on initial studies, not on a comprehensive testing program or real world field experience, is the thinnest of reeds on which to conclude that LPFM will not adversely impact digital audio radio. Moreover, the IBOC proposal is only one of many possible ways to convert AM and FM spectrum to digital use. How can the Commission establish the lack of impact on a yet-unadopted digital standard for audio broadcasting?

USADR is just at the verge of doing some real world testing. For example, another experimental broadcast construction permit by USADR for digital audio broadcast testing (for Station WD2XAB) was recently granted on June 1, 1999 – well after the LPFM proceeding commenced. The purpose of the experimental operation is to obtain coverage and interference data with respect to interference received by the DAB station. The application for this experimental station demonstrates that USADR requested a two-year period to complete its experimental testing program.

While the PRROs understand that the Commission has stated its firm intention not to jeopardize digital radio by the LPFM proceeding, the PRROs do not understand why the Commission would commence a rulemaking proceeding for LPFM, solicit comments, and deny

requests for extensions of comments based on the need for additional IBOC information, if the Commission truly intends to fully consider the impact of LPFM on IBOC. The PRROs contrast the treatment of FM spectrum with the substantial protections afforded to TV spectrum in the years leading up to adoption of the standards and allocations for digital conversion of the TV industry. The PRROs ask: If IBOC (or some other digital FM service) is worth doing at all, isn't it worth doing right? Isn't it worth waiting for full information on possible effects of LPFM, after implementation of digital audio broadcasting so that the Commission can make a decision on a complete record with real world experience as to the effects? What is the harm of waiting? The PRROs urge the Commission not to risk the digital future of radio by prematurely authorizing LPFM. Once authorized, the Commission will not be able to put the genie of LPFM back into the bottle.

III. OBSTACLES TO THE FCC's POLICY OBJECTIVES

Based on the experience of public radio, the PRROs are concerned that LPFM will be unable to fulfill the policy objectives envisioned by the FCC in the *NPRM.* The NPRM suggests that LPFM will be community-oriented radio, operated perhaps in part or in whole, as a noncommercial service. As existing broadcasters with vast experience with community-oriented and noncommercial broadcasting, the PRROs are very skeptical about the success of LPFM overall. The history of public broadcasting supports the PRROs skepticism; recent experiences with existing marginal noncommercial educational stations confirm it.

Early public radio stations struggled with financial and technical problems. Even after nearly 50 years of development, by 1967, many noncommercial educational radio stations were low-powered, Class D "starter kit" stations, which had not grown as the FCC intended.[9] Out of

[9] Witherspoon and Kovitz, *The History of Public Broadcasting*, page 33 (1987).

412 noncommercial educational radio stations in 1969, nearly ½ were Class D stations, most were virtually inaudible, most could not be heard reliably throughout their service area, and very few had enough financial support to sustain themselves.[10] The very existence of these stations was a day-to-day struggle. Most stations operated only during very limited weekday hours, as an adjunct to college and university curricula and student activities.[11] This resulted in extremely inefficient use of FM spectrum.

The advent of public radio grant standards and funding from the Corporation for Public Broadcasting in 1969, coupled with the creation of National Public Radio ("NPR") in 1970, transformed public radio. Yet, even now, public radio struggles with fiscal difficulties that do not plague commercial radio. This is so even with the benefits of CPB-funding, substantial state funding, institutional support from colleges and university licensees, committed listener/donors, established corporate support, and (sometimes) sophisticated fundraising, as well as the highest-quality programming and support provided by NPR, Public Radio International and independent public radio producers. Given this history and the increasing costs and competition that radio and public radio face each day, the PRROs view with great skepticism the Commission's assertion that low-powered community-oriented radio can survive at all, especially as a noncommercial service, in a way that would serve the public interest. [12] The experience of public radio is to the contrary -- without CPB and NPR, public radio might well have declined or died. We urge the Commission not to ignore history.

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[10] *Id.*

[11] *Id.*

[12] The PRROs refer the FCC to the Comments of the Station Resource Group in this proceeding, which address the history of Class D stations in FCC policy.

Moreover, the PRRO member stations' recent experience suggests that marginal noncommercial educational broadcasters are discovering that stand-alone operations, whether on a full-time or less-than-fulltime basis, even with institutional support (and service areas that would dwarf LPFMs) are not sustainable long-term.[13] Many of these marginal operations are turning to established, successful public broadcasting operations for help and support through various cooperative endeavors. Thus, the PRROs submit that any low-powered radio service, and particularly a low-powered noncommercial LPFM service, may be doomed from the start. The Commission may only be setting up LPFM applicants for heartache, failure and bankruptcy. The policy goals underlying LPFM may not be achievable for sub-standard, low-powered, part-time operations.

Even if LPFM made fiscal and spectrum sense, the PRROs are concerned that the policy goals underlying LPFM cannot be enforced consistent with the First Amendment. The Commission has not proposed that LPFM stations provide only local programming, although that seems the clear goal of the NPRM. Indeed, what is "local" may be the matter of some disagreement. What is "local" programming? That which is locally produced? Locally originated? Delivered by a local DJ? Does use of a "local" CD player rack, which can play 100-500 CDs in a row, without interruption, qualify as "local" programming? What would prevent LPFM stations from acquiring all programming from national sources or other broadcasters and airing only non-local programming (essentially bypassing the ownership limitation that the *NPRM* contemplated)? Moreover, the Commission must tread with care on the programming obligations of LPFM stations, as programming issues are fraught with free speech and First

[13] For example, as the Commission is no doubt aware, former local D.C. community jazz station WDCU(FM) was unable to continue a financially viable operation as a noncommercial station

continued...

Amendment issues. From the PRRO perspective, the Commission will not be able to mandate that LPFM remains a truly local service, as envisioned in the NPRM. This makes the underlying policy goals for the proposed service suspect.

IV. IMPACT OF LPFM ON PUBLIC RADIO STATION LISTENERS; INCREASED INTERFERENCE AND RELATED ENGINEERING ISSUES

The PRROs submit that, from an interference and engineering standpoint, LPFM is not spectrally efficient. The PRROs are concerned that elimination of second and third adjacent channel interference, added to the increased RF congestion from LPFM, will adversely affect the FM band and the public's enjoyment of public radio. Based on their own experience, as well as studies and tests conducted by other commenters in this proceeding, including National Public Radio ("NPR"), the Corporation for Public Broadcasting ("CPB"), the Consumer Electronics Manufacturers Association ("CEMA"), the National Association of Broadcaster ("NAB") and others, the PRROs believe that presently available data demonstrate that LPFM simply is not viable without forcing additional unacceptable interference on listeners and broadcasters. Even then, the CEMA Study results hit closer to home for the PRROs -- public radio would be disproportionately affected by LPFM interference given public radio's prevalent lightly processed news/talk, jazz and classical music formats.

In fact, the PRROs believe that it is odd that the proponents of LPFM have not borne the burden of proving the lack of interference that would be caused by the new LPFM service. Instead, the Commission has shifted the burden of proof onto existing broadcasters.[14]

...continued

and the license was assigned to C-SPAN. Other public radio stations have met similar fates.

[14] The Comments of Station Resources Group ("SRG") in this proceeding also address this issue of the lack of interference study by the Commission and the shifting of the burden of interference showings to broadcasters.

A. CEMA Study on FM Receivers.

The PRROs urge the Commission to review carefully the results of the FM Receiver Interference Tests, Laboratory Test Report; Conducted under the auspices of: National Public Radio, Consumer Electronics Manufacturers Association, Corporation for Public Broadcasting; Published by: Consumer Electronics Manufacturers Association; Test Laboratory: RMC Technologies, North Olmsted, Ohio; Thomas B. Keller, Consultant; Robert W. McCutcheon, Test Manager (the "CEMA Study").

Based on the PRROs review, the CEMA Study results indicate that LPFM, as proposed, will have a substantial adverse impact on the RF environment and listener reception of radio stations – particularly public radio stations. Thus, taking a holistic approach towards the overall effect of LPFM stations on the ability to receive FM band signals, rather than the piecemeal approach used in the *NPRM* for its engineering conclusions, LPFM would not serve the public interest. Radio listeners will suffer if LPFM is authorized.

The PRROs have derived the following conclusions from review of the CEMA Study results:

→ Based on subjective listening tests, there is noticeable interference to listeners, especially with a less processed or "low-modulation" signal (such as the classical music or news/talk programming used by many public radio stations), even with existing second and third adjacent channel protection levels. The addition of any new LPFM stations, *even with existing second and third adjacent channel protection*, will result in an unacceptable increase in interference to listeners. Without current second and third adjacent channel protections, interference will be much worse and public radio station and other stations with lightly processed programming will be disproportionately affected by this interference. The result will be a loss of quality public radio service to listeners – ***a loss of service that discriminates against public radio listeners.***

→ The objective tests on second and third adjacent channel interference confirm the results of the subjective listening tests. ***For the second adjacent test, thirteen of the sixteen receivers tested could not achieve the minimum acceptable listenable signal; three of the thirteen receivers failed to function at all. For the third adjacent test, noise increased with the undesired signal and one eighth of the receivers tested failed to function.*** Thus, these tests confirmed the results of the subjective listening tests – LPFM will make an existing interference situation worse and result in loss of quality public radio service to listeners.

→ Intermodulation (which is not even regulated under current FCC rules) currently causes substantial interference to reception of existing radio services. Adding new LPFM stations to the intermodulation mix will only exacerbate the problem. ***Eight of the sixteen receivers tested could not achieve the minimum acceptable listenable signal once intermodulation was introduced.***

→ When tested in an on-air environment, *every receiver performed worse – some substantially worse.* Even the best home HiFi receiver had a great loss in performance in an on-air environment. Thus, laboratory testing does not equate with real-world receiver performance experienced by current radio listeners -- the "field" impact of LPFM on interference will be much worse than lab tests indicate. Moreover, there is no way for listeners (or consumers) to "purchase" their way out of the interference caused by LPFM (even if forcing new radio purchases was a valid policy objective for the FCC to pursue).[15]

→ The current co-channel protection criteria for stations are grossly insufficient. The average receiver needed over <u>twice</u> the amount of dB protection afforded by current FCC standards to achieve the <u>minimal</u> acceptable listenable signal at the protected contour. The addition of any new LPFM stations will make a bad situation worse and <u>substantially</u> increase interference. The result will be loss of quality public radio service to listeners.

→ The *NPRM* proposed elimination of the IF taboo for LPFM. The CEMA Study shows that elimination of the IF taboo would result in a <u>*significant and serious*</u> increase in interference for listeners. If LPFM is adopted, most receivers will be unable to weed out the undesired LPFM signal in favor the desired signal, if the LPFM station violates the IF taboos.

---

[15] The FCC staff has suggested that the reason the FCC is interested in pursuing LPFM – rather than the Internet – for additional community radio channels is because the cost of accessing the Internet is prohibitive. (*Diane Rehm Show, WAMU, July 6, 1999*). Thus, the FCC has wrongly assumed that an advantage of LPFM is that users with inexpensive radios can access it. The CEMA Study demonstrates that low-cost radios will not work in a congested LPFM environment – even higher-cost radios will suffer in a more congested LPFM environment.

The introduction of LPFM to the current RF environment in the FM band will yield an intolerable result -- a loss of quality radio service to existing listeners, with the largest interference being borne by public radio stations that utilize low-modulation programming (like the PRROs members). The FCC cannot authorize LPFM on this technical record. LPFM cannot proceed unless the FCC can suspend the laws of physics from operating on LPFM and existing public radio stations.

The CEMA Study also contains more specific data that supports the conclusions above. For example, the CEMA Study shows (predictably) that the majority of receivers were more sensitive to interference, including 1st, 2nd and 3rd adjacent channel interference, when the FM system was operating in stereo with frequency-division multiplexing. This is predictable because stereo uses a larger portion of the 200 kHz bandwidth, including the portion from 23 kHz to 53 kHz and a 19 kHz pilot subcarrier. Stereo, of course, enhances the listening experience by providing the listener with greater spatial dimension or directivity.

For subjective "listening" tests on 2nd and 3rd adjacencies, the CEMA Study found that, when the desired signal is modulated with dense program material like processed rock music, interference is masked. Yet, importantly for public radio, when the desired signal contains lightly processed formats, such as classical music, jazz or news/talk passages, interference is apparent. LPFM will have a disproportionate interference impact on public radio stations, many of which carry classical music, news and public affairs, or talk programming during some hours of the broadcast day.[16] Thus, existing 2nd and 3rd adjacent channel protections already

[16] In fact, NPR has also incorporated sound passages, including classical music, in its news and information programs to enhance the news listening experience.

adversely affect listeners' enjoyment of public radio programming – elimination of those protections will further degrade public radio listeners' enjoyment.

The results of the subjective tests were recorded and transferred to CD. The PRROs are informed that NPR is submitting the CDs with its Comments in this proceeding. We urge the Commission and its staff to "lend an ear" and hear, for themselves, what listeners would hear if LPFM were authorized -- hissing and crackling on existing stations.

For interference testing, the CEMA Study used a 45 dB signal-to-noise ratio as the "target," meaning the minimum acceptable for quality broadcasting. By comparison, consumer grade CD players routinely specify a signal-to-noise ratio of greater than 90 dB. The CEMA Study showed that, for co-channel interference, none of the 16 receivers tested came near meeting the 45 dB target at the FCC's –20 dB protected contour (i.e., the contour for which a co-channel station is protected from interference). At the 45 dB target, the average receiver needed an additional 22 dB of protection. Thus, as concluded above, the FCC's existing co-channel interference criteria do not provide a minimally acceptable quality signal for existing stations. The CEMA Study concluded that a significant increase in interference would be experienced with the addition of new stations that use the existing FCC -20 dB co-channel protection. Thus, LPFM would result in additional interference.

For objective tests of 1st adjacent interference tests, the CEMA Study showed that several receivers did not meet the 45 dB target. The CEMA Study suggested that the 1st adjacent protection criteria should take into consideration the results of the tests, subcarrier performance and the effect of the first adjacent analog signal on the IBOC digital sideband. Thus, the FCC's assumption that keeping the 1st adjacent channel protection standard the same for LPFM was preserving the "status quo" is incorrect. The existing 1st adjacent channel

protection standard imposes reception problems on listeners; introducing new LPFM 1st adjacent stations will make the situation worse. Yet again, radio listeners would suffer additional interference if LPFM were authorized.

For objective tests of 2nd adjacent channel interference, the CEMA Study showed that some receivers could not meet the 45 dB target at the 40 dB D/U ratio. In other 2nd adjacent tests, noise increased with the undesired signal, and in some cases the receivers stopped working. The CEMA Study concluded that the interference increased significantly when the D/U ratio exceeds –20 dB (in contrast to the FCC's established –40 dB D/U standard). The end result is that existing second adjacent channel interference is a bad problem; introduction of LPFM will make it worse. For objective tests of 3rd adjacent channel interference, the noise increased with the undesired signal, and in some cases the receivers stopped working. Using an S/N ratio of 20 dB as the failure point, at higher D/U ratios several receivers failed. In the majority of receivers, interference increases noticeably with an increase in 3rd adjacent interference. Therefore, existing second and third adjacent protections must be maintained.

The CEMA Study also tested receiver performance in a multi-station on-air environment compared to laboratory tests. The sensitivity to interference was receiver dependent. All of the receivers tested had a reduced performance in the on-air environment.[17] Thus, the PRROs submit that the real world effects of LPFM on radio listening in the RF environment cannot be discerned based on sterile laboratory tests. The Commission must anticipate and expect that the

[17] The CEMA Study results are consistent with the experience of public radio stations. For example, Station WDUQ, Pittsburgh, Pennsylvania reports interference due to a college station at 1,500 watts at a negative HAAT. Station WDUQ suffers from significant blanketing interference around the college campus - at an 11th adjacency. Clearly the RF environment is already sufficiently crowded.

"real world" situation of LPFM interference will be much worse than the best mathematical models can predict.

Moreover, the CEMA Study concluded that intermodulation at 800 kHz and 1600 kHz from a desired signal adversely affected the signal-to-noise ratio in a serious way. The studied receivers had difficulties screening out intermodulation. Thus, the CEMA Study further concluded that it should be mandatory for new stations (like LPFMs) to perform a detailed study of possible intermodulation scenarios that would interfere with existing services. The PRROs submit that the intermodulation problems further demonstrate that the FM band already suffers from RF congestion, even without LPFM. With LPFM, the interference problems for listeners multiply.

For all of these reasons, the PRROs urge the Commission to protect existing public radio stations and listeners from further encroachment on FM signal quality reception and find other spectrum or other distribution mechanisms to fulfill the Commission's policy objections. From a technical perspective, the FM band is too fully mature to tolerate the overlay of another service like LPFM.

B. NAB Receiver Study Results on Second and Third Adjacent Channel Interference.

The PRROs also urge the Commission to review carefully the FM Receiver Interference Test Results Report by Carl T. Jones, commissioned by NAB. This study focussed more specifically on second and third adjacent channel interference, instead of the more holistic approach of the CEMA Study. Based on data from the NAB study, the PRRO's believe that the FCC wrongly assumed that second and third adjacent channel restrictions could be relaxed to make room for LPFM.

The PRRO's review of the NAB receiver data has led the PRROs to conclude as follows:

→ The results of the NAB receiver study do not support relaxation of the second and third adjacent channel restrictions. Car radios and home stereos generally performed better than personal, portable and clock radios. However, car radios and home stereos generally do not perform better than the FCC expects (given the current co- and adjacent channel protection rules). Moreover, car radios are subject to wide variations in desired and undesired signal levels. Thus, any elimination of second and third adjacent channel protection will have "real world" effects on actual listener reception of radio signals, including public radio signals.

C. Anecdotal Evidence of Second and Third Adjacent Channel Interference.

The PRROs member stations also believe that anecdotal evidence of their "real world" experiences with second and third adjacent channel interference is relevant to this proceeding. One case study is the example of Stations KXPR and KXJZ both in Sacramento, California. Stations KXPR and KXJZ already experience second and third adjacent channel interference within their protected contours due to grandfathered contour overlap (i.e., "short-spacings") under Section 73.509 of the FCC rules, sometimes known as "donuts."

Station KXPR experiences interference from a third adjacent channel station in Davis, California due to a contour overlap "donut." Faculty on the college campus in Davis has complained to Station KXPR that they are unable to receive Station KXPR due to the presence of the third adjacent channel station. Station KXPR also experiences interference from a 400 watt third adjacent channel station that operates on the campus of a high school.

Station KXJZ (the jazz "sister" station to KXPR) experiences interference from a 3 kilowatt second adjacent channel station at the edge of KXJZ's coverage area (a partial "donut"). Listeners up to 10 miles away from KXJZ's protected contour complain about interference to KXJZ from the third adjacency.

Another case study is from Station WRVO, Oswego, New York. In 1976, Station WRVO had a reliable signal (and listenership support) 80-85 miles out from its transmitter site (far beyond its protected contour). Yet, encroachment from second and third adjacent channel

stations (permitted by current rules) eroded the interference-free region. The reliable signal radius has shrunk to 35-40 miles. WVRO has lost nearly 800 supporters who cancelled memberships because they could no longer hear the station. While public radio stations understand and accept that new adjacent channel full-service stations may come onto the radio scene, the Commission must understand and accept that second and third adjacent channel stations – whether LPFM or not – come at a price. The price is increased interference and loss of radio reception by existing listeners.

From KXPR/KXJZ's and WVRO's real world experience, the PRROs conclude that elimination of second and third adjacent channel interference will subject public radio stations to further encroachment on the integrity of the public radio listening experience. For the sake of their listeners, the PRRO member stations urge the Commission to protect quality public radio listenership and reject LPFM in the FM band.

V. IMPACT ON ENFORCEMENT

The PRROs are also concerned about the impact of LPFM on the Commission and its enforcement efforts, as well as the impact on the PRRO member stations efforts to protect signal integrity and the good name of noncommercial broadcasting.

The PRROs worry that the implementation of LPFM will place an undue burden on smaller broadcasters, like the PRRO member stations, in trying to protect their listeners from interference. This is particularly so because public radio on Channels 200-220 is based on "contour protection," not minimum spacing between allotments. Thus, each application for new service in an area must be individually studied to determine its impact on existing public radio service – there are no shortcuts.

Public radio stations already spend an increasing amount of time and money trying to protect their existing service areas (inside and outside the protected contours) from encroachment

and interference. There has been a meteoric rise in applications for new noncommercial educational radio stations and new FM translator stations in the last several years, as pointed out in the Comments of Rocky Mountain Public Radio and West Coast Public Radio, as well as the Comments of the Station Resource Group, in Docket 95-31. Some of these applications lack appropriate technical showings or legal qualifications, or are poorly engineered (or, for translator stations, propose a new station in an area, which already receives an off-air signal on a co or adjacent channel). PRRO member stations are spending time and money for legal and engineering services fighting against signal encroachment or verifying that applications filed with the FCC have been properly engineered to protect existing stations.

The PRROs are not overstating this problem -- it has an observable impact on station budgets and staff members' time. For example, public radio Station WOI-FM in Ames, Iowa has spent over $28,000 in the last fiscal year on engineering and legal fees to defend the station's signal from encroachment by FM translator stations that would interfere with listener reception of WOI-FM. In addition, public radio Station WUOL-FM in Louisville, Kentucky has had to defend its station signal about a dozen (12) times in the past several years from encroachment by FM translator stations that would interfere with listener reception of WUOL-FM. Similarly, Station WVRO has been fighting encroachment from translators and other stations on first and second adjacent channels just outside its protected contour.

Thus, in the past several years, PRRO member stations have had to spend significant amounts of funds (let alone staff time and energy) to protect signal integrity, despite adequate Commission prosecution of seemingly proper applications. If LPFM is authorized -- even as a secondary service -- PRRO member stations will need to be doubly vigilant for LPFM applications that might impact existing public radio service, whether it be translator service,

service outside a protected contour, co- or adjacent- channel interference, intermodulation problems, blanketing interference or other technical impacts on existing radio service. The price of LPFM will be excessive eternal vigilance for existing public radio broadcasters. This price is simply too high.

The PRROs are concerned that LPFM applications will flood the FCC, even as LPTV applicants inundated the FCC after low power television was authorized. The PRROs believe that, unless the Commission plans on hiring additional staff to process (and police) LPFM applications, LPFM would deplete already scarce FCC staff resources, resulting in a shift of further responsibilities off FCC staff and onto potentially affected broadcasters, like the PRRO member stations, thereby increasing the costs of public broadcasters.

Finally, the PRROs are concerned that LPFM has been proposed as a noncommercial service, yet without any explanation to LPFM proponents of what this restriction currently means under FCC rules and policies or what enforcement efforts might be necessary to ensure compliance. Public broadcasting has worked hard to ensure that its service is truly noncommercial; public radio has been largely self-policing in complying with noncommercial operation rules and policies. The public radio industry provides multiple seminars each year and numerous other informational tools designed to educate public radio staffs on the intricacies of noncommercial operation and the difference between underwriting and advertising. Who will educate LPFM operators on these issues? How will the FCC enforce noncommercial operation when it takes place outside the reserved band (Ch. 200-220)? Does the FCC expect that a financially strapped newcomer LPFM station will be able to sustain itself as a noncommercial operation? The PRROs are concerned that LPFM operators may unknowingly (or knowingly) violate the noncommercial operation rules on the reserved band, which will adversely affect

public perception of public radio and the good name, not to mention sponsor acceptance of underwriting restrictions, that public radio has spent over seventy-five (75) years establishing.

The PRROs urge the Commission to consider the enforcement consequences of LPFM on both FCC staff and existing broadcasters, as it contemplates whether the costs of LPFM outweigh the benefits of a new low-powered service in the FM band.

VI. CONCLUSION

For all the reasons given above, the PRROs urge the Commission not to move forward with LPFM at this time. LPFM will adversely affect public radio, in that it will result in (i) loss of existing public radio FM translator and satellite/repeater service; (ii) loss of existing public radio service outside protected contours; (iii) jeopardization of the substantial federal, state and private investment in public radio; (iv) loss of subcarrier services, particularly radio reading services for the print disabled; (v) an unknown (and unknowable) impact on public radio conversion to digital audio broadcasting; and (vi) the introduction of an intolerable level of new interference throughout the FM band, with public radio bearing the brunt of the effects of new interference because of its typical program modulation. In addition, the PRROs are concerned that LPFM is not a viable service, and that the Commission cannot constitutionally force LPFM licensees to fulfill the Commission's expectations.

If, despite the record to the contrary established in this proceeding, the Commission should feel that LPFM is a sufficiently important service, the FCC should find other, less-occupied spectrum, for LPFM to use or advocate another distribution mechanism, such as Internet webcasting. If the Commission should conclude that LPFM must use the FM band (despite the PRROs and others' opposition to the overlaying of this new service on existing public radio service), the PRROs urge the Commission to delay LPFM until radio stations (and public radio stations in particular) have been able to fully study the effects of LPFM on the

existing RF environment and to implement the conversion to digital audio broadcasting so that the full impact of LPFM on real world DAB can be evaluated.

Respectfully Submitted,

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Joined in this Proceeding by:

EASTERN PUBLIC RADIO

CALIFORNIA PUBLIC RADIO

PUBLIC RADIO IN MID-AMERICA

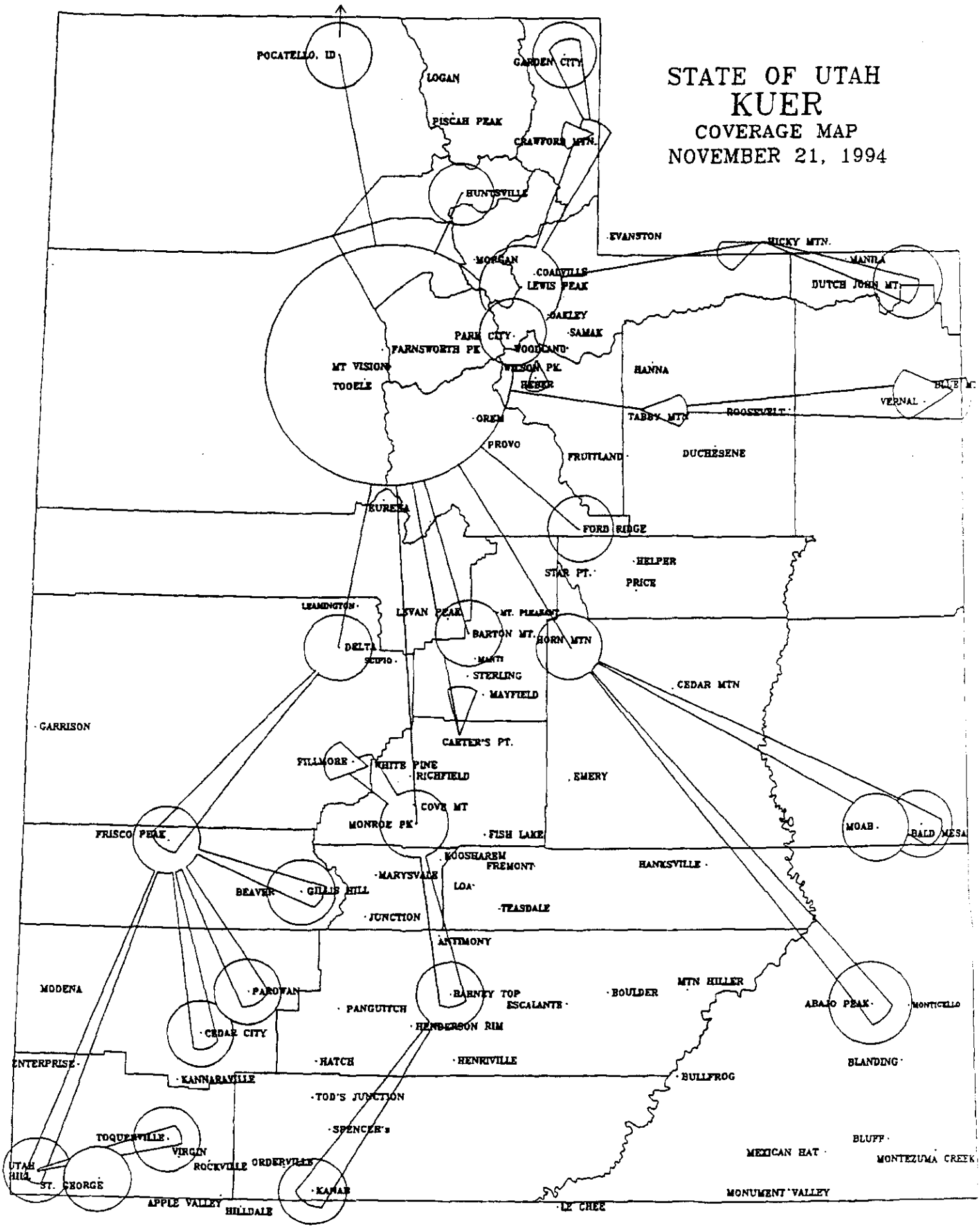
SOUTHERN PUBLIC RADIO

August 2, 1999

ATTACHMENT A

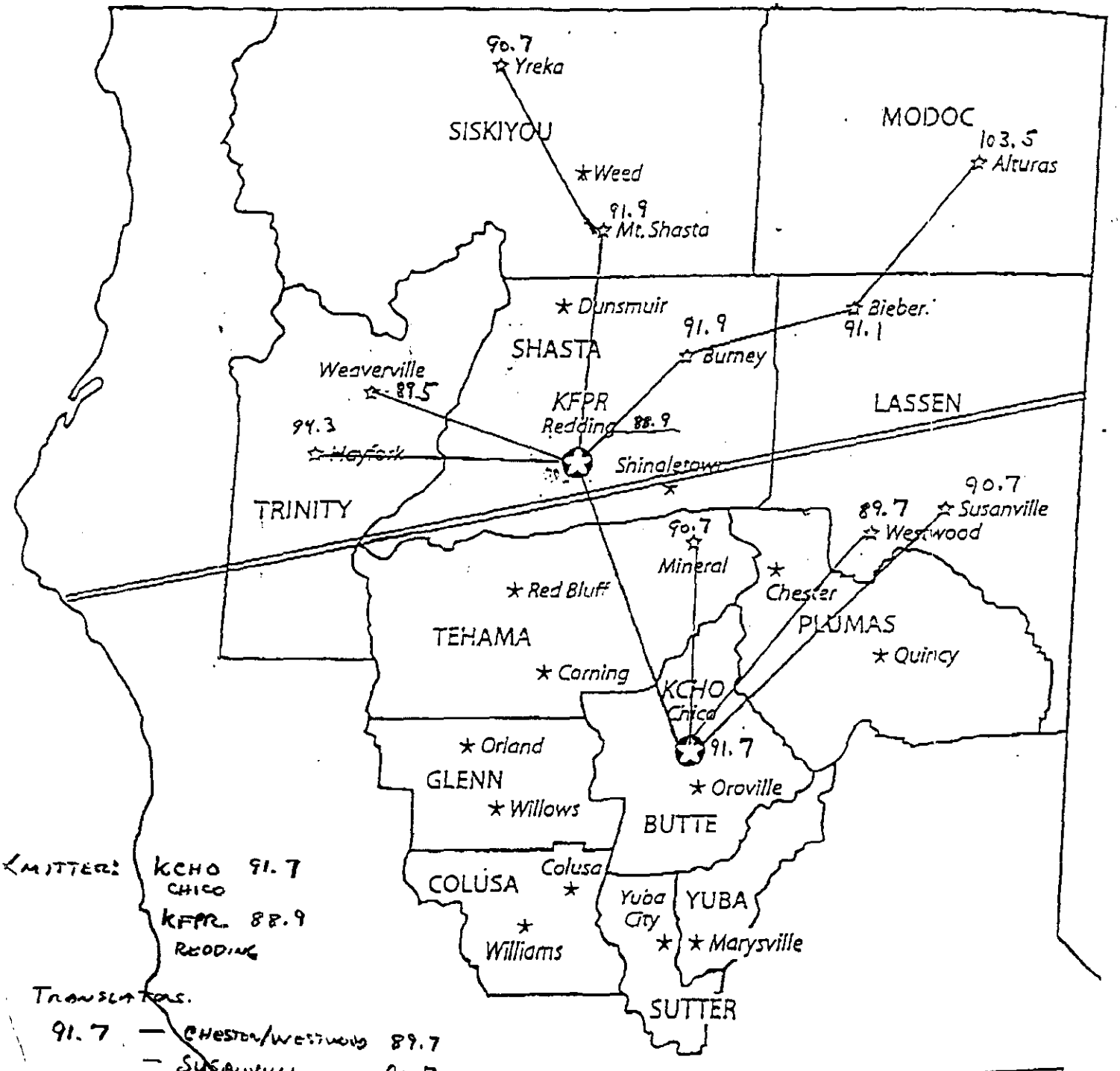
(Maps of Translator Service Areas)

DCLIB01:1187305-2


STATE OF UTAH
KUER
COVERAGE MAP
NOVEMBER 21, 1994
POCATELLO, ID
LOGAN
GARDEN CITY
PISCAH PEAK
CRAWFORD MTN.
HUNTSVILLE
EVANSTON
HICKY MTN.
MANILA
MORGAN
COALVILLE
LEWIS PEAK
DUTCH JOHN MT.
OAKLEY
PARK CITY
SAMAK
FARNSWORTH PK
WOODLAND
MT VISION
WILSON PK.
HANNA
TOOELE
HEBER
VERNAL
TABBY MTN
ROOSEVELT
OREM
PROVO
FRUITLAND
DUCHESENE
EUREKA
FORD RIDGE
HELPER
STAR PT.
PRICE
LEAMINGTON
LEVAN PEAK
MT. PLEASANT
BARTON MT.
HORN MTN
DELTA
SCIPIO
MANTI
STERLING
MAYFIELD
CEDAR MTN
GARRISON
CARTER'S PT.
FILLMORE
WHITE PINE
RICHFIELD
EMERY
COVE MT
MONROE PK
MOAB
BALD MESA
FRISCO PEAK
FISH LAKE
KOOSHAREM
FREMONT
HANKSVILLE
MARYSVALE
BEAVER
GILLIS HILL
LOA
TEASDALE
JUNCTION
ANTIMONY
MODENA
PAROWAN
BARNEY TOP
BOULDER
MTN HILLER
ABAJO PEAK
MONTICELLO
PANGUITCH
ESCALANTE
CEDAR CITY
HENDERSON RIM
ENTERPRISE
HATCH
HENRIVILLE
BLANDING
KANNARAVILLE
BULLFROG
TOD'S JUNCTION
SPENCER's
TOQUERVILLE
VIRGIN
BLUFF
MEXICAN HAT
MONTEZUMA CREEK
UTAH HILL
ST. GEORGE
ROCKVILLE
ORDERVILLE
KANAB
APPLE VALLEY
HILLDALE
MONUMENT VALLEY
LE CHEE

CALL	AREA SERVED	SITE COORD.	SITE DESCRIPTION
K211BB 90.1 MHz	Kanab	N37-03-38 W112-31-13	1.6 Km NE of Kanab, Ut.
K211BJ 90.1 MHz	Toquerville	N37-16-21 W113-16-34	1.6 Km NNE of Toquerville,Ut.
K211BU 90.1 MHz	Parowan	N37-50-32 W112-58-10	5 Km NW of Summit, Ut. and 12 Km W. of Parowan, Ut.
K211CK 90.1 MHz	Fillmore	N39-2-10 W112-19-31	Cedar Mtn 7 Km N of Fillmore, Ut.
K211CL 90.1 MHz	Beaver	N38-27-04 W112-39-05	Gillis Hill, 3.6 Km W. of US I-15 11 Km N. of Manderfield, Ut.
K211CP 90.1 MHz	Rural Emery County	N39-10-17 W110-37-09	Cedar Mtn 34 Km SE Huntington, Ut.
K211CQ 90.1 MHz	Manila & Dutch John	N40-57-34 W109-24-58	National Forest Radio Facility, 20 Km ESE of Manila, Ut.
K211CS 90.1 MHz	Monticello	N37-50-22 W109-27-40	Abajo Peak 11 Km WSW of Monticello, Ut
K211CV 90.1 MHz	Vernal & Redwash	N40-21-01 W109-09-49	Blue Mountain 15 mi E. of Redwash, Ut.
K211DH 90.1 MHz	Anabella, Glenwood	N38-38-04 W112-03-33	Cove Peak 5.5 Km east of Monroe, Ut.
K213AA 90.5 MHz	Laketown & Garden City	N41-52-57 W111-16-09	5 mi NE of Laketown, Ut.
K213AM 90.5 MHz	St. George	N37-03-49 W113-34-20	Webb Hill, 3 mi S. of St. George,Ut
K213BC 90.5 MHz	Moab (downtown)	N38-34-26 W109-32-57	35 East Center Street Moab, Ut.
K216AC 91.1 MHz	Tropic & rural Garfield County	N37-45-21 W110-52-27	Barney Top Mountain 25.7 Km NE of Tropic, Ut.

Sevice Region For Northstate Public Radi and California State University, Chico



TRANSMITTER: KCHO 91.7 CHICO
KFPR 88.9 REDDING

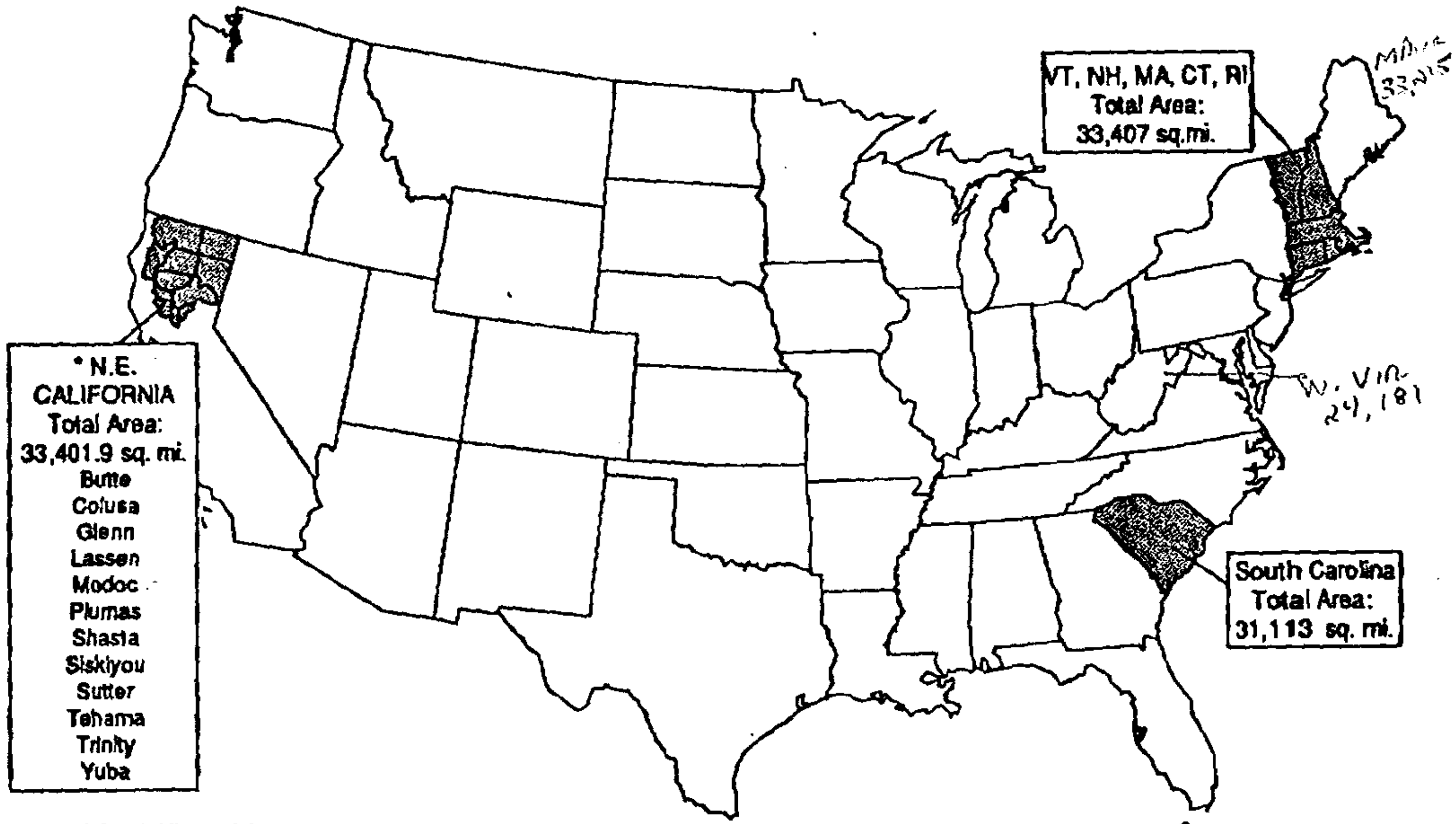
TRANSLATORS.

91.7 — CHESTER/WESTWOOD 89.7
— SUSANVILLE 90.7
— MINERAL 90.7
88.9 — BURNEY 91.9
BIEBER 91.9
ALTURAS 103.5

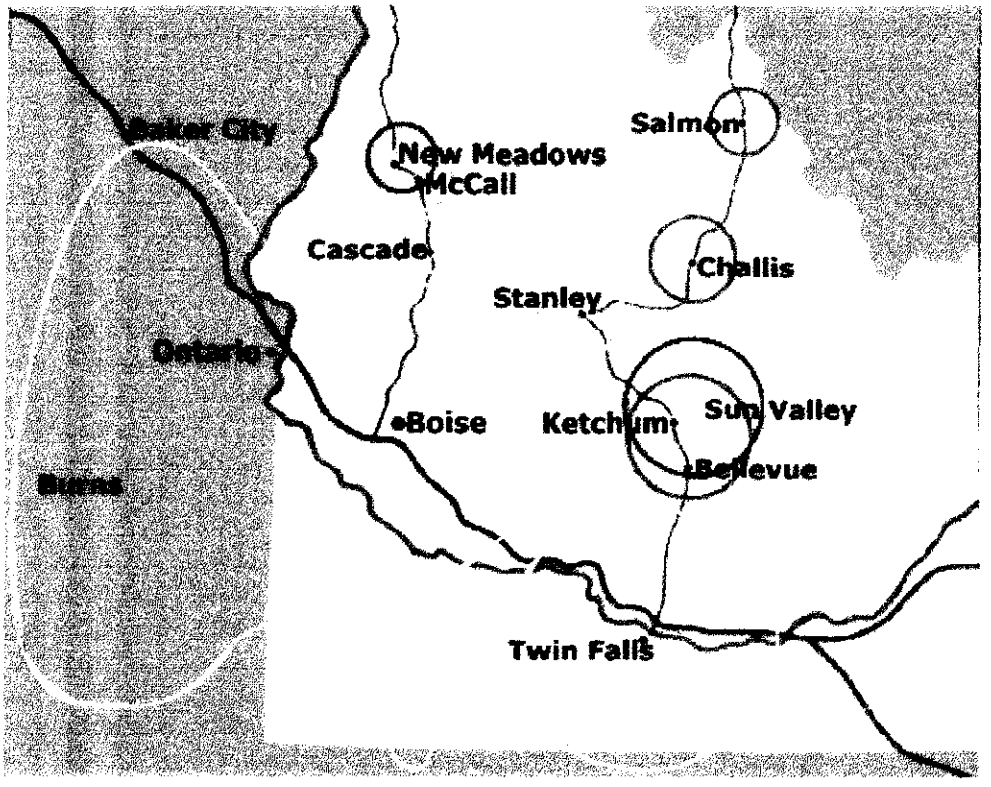
MT. SHASTA - 91.7
YREKA - 90.7
WEAVERVILLE - 89.5

0 10 20 30 40 50

TOTAL AREA COMPARISONS



Sources: California Statistical Abstract 1990
Dept. of Finance, October 1990
Northeastern California Regional Profile, UCEDAP, CSU, Chico, October 1990


Baker City
New Meadows
McCall
Salmon
Cascade
Challis
Stanley
Ontario
Boise
Ketchum
Sun Valley
Bellevue
Twin Falls
RadioVision
Chronicle
RadioVision & Chronicle
RadioVision, Chronicle & Idaho's Jazz Station

ATTACHMENT B

(Case Studies of Service Outside Protected Contours)

CASE STUDY
KQED-FM, San Francisco, California

KQED-FM has 7,132 current members with mailing addresses in counties primarily outside the 60 dBu predicted contour. In some cases small parts of a county are within the 60 dBu contour.

ARB audience surveys show that KQED-FM has eight listeners for every member. This suggests that KQED-FM has approximately 57,056 listeners outside the 60 dBu contour.

KQED-FM averages $83 annually per member. If KQED-FM lost all of these 7,132 members because of interference, KQED-FM would lose $591,956 annual income.

CASE STUDY
KXPR/KXJZ, Sacramento, California

Capitol Public Radio, licensee of Stations KXPR and KXJZ (Sacramento, CA), have identified substantial station listenership outside both stations 1 mV/m contours. For the sake of simplicity, the stations' data has been combined for purposes of this case study. KXPR/KXJZ counts 10,284 subscribers outside its 1 mV/m contours who support one of its two stations. This figure represents fifty-four 54 percent of the combined stations subscriber base. Using a formula for estimating listenership based on subscriber figures (at 8 times the subscriber figure), KXPR/KXJZ would have a total of 82,282 of its listeners who might be affected by interference caused by the onslaught of many new low power broadcast stations in our area. This estimate is an accurate one, in KXPR/KXJZ's opinion.

At an average pledge amount of $80, Capital Public Radio, licensee of KXPR/KXJZ could lose as much as $822,720 if these low power stations interfered with listeners outside our coverage areas and caused listeners to discontinue financial support.

Additionally, Capital Public Radio operates noncommercial FM station KXSR (Groveland, CA.), and KKTO (Tahoe City, CA.). In the case of KXSR, the licensee has a growing audience in Modesto, CA, which appreciates and supports the classical music format that the station provides. Unfortunately, Modesto is well outside the KXSR protected 1 mV/m contour, and these listeners could lose their service due to LPFM.

CASE STUDY
KCFR, Denver, Colorado

Colorado Public Radio's Denver Station KCFR, 90.1 FM, has a substantial number of listeners and donors outside of the predicted 60 dbu contour. The station has 618 donors (as of 6/30/99) in Fort Collins, sixty miles north of Denver in an area that, based on FCC technical predictions, should not receive the KCFR signal. An additional 215 donors reside in areas north of Fort Collins, including 25 donors in Cheyenne, Wyoming, which is over 100 miles away from Denver. This is a total of 833 donors - listeners who receive KCFR's programming and value it enough to provide financial support. Using the formulate that one out of every ten listeners give financial support to public radio, this would mean that existing public radio service to 8,330 listeners could be jeopardized with the implementation of LPFM as proposed.

CASE STUDY
WOI-FM, Ames, Iowa

Iowa State University Station WOI-FM, Ames, Iowa, reports that 22% of its listeners reside outside of the station's protected contour. Because the areas outside the WOI-FM contour are largely rural, sparsely populated Iowa farmland, the 22% figure is astounding. Moreover, WOI-FM estimates that the 22% figure translates to 22,282 listeners outside its protected area.

CASE STUDY
KPBX-FM, Spokane, Washington

Station KPBX-FM reports that half its listenership is from outside its county, which may include listeners that tune to one of KPBX-FM's eleven translators. KPBX-FM's total membership brings in about $540,000 of financial support. Station KPBX estimates that about $161,000 in membership support is generated from outside Spokane County and about $70 thousand from underwriters outside the county limits. Of that total figure, perhaps $100 thousand results from coverage by translators.